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A 'Broad Categorizer'and language modeling in relation to selected expressive factors

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Abstract

The aim of this paper is to investigate the interaction between cognition and emotion in the process of language modelling in the presence of social power. Cognition is related to mental behavior which an individual usually uses by problem solving. Emotions represent expressive factors such as compliments/sweeteners, intensificators etc. In our case, it is a simulation of global processing of language information by a broad categorizer during social problem solving. The research was carried out at the university and 148 students took part. The results indicate that the 'broad categorizer' uses compliments, pre-sequences, politeness factors and their combinations in situations with social distance and power. On the other hand, in situations with social proximity and power, he/she uses language models with politeness factors, intensificators and post-sequences/supporting details.

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Keywords: ´Category width´ cognitive style; broad categorizer; language modeling; emotional factors; request

1. Introduction

Interconnection of emotion with cognition in the process of the creation of language models of emotional factors in the presence of social influence belongs to an interesting area of research. It allows an insight into the application of the various scientific disciplines (psychology, linguistics, computer science etc.). It approximates the speech production of individual emotions whereby the main role rests in the processing of language information and in social influence. Current studies focus on the investigation of interindividual differences in emotion processing (Holodynsky,& Friedlmeier, 2006) or on emotion recognition in language modeling (Lin, Siahaan, Chin, Wang,&

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Wang, 2013, Xin,& Gu, 2013, Sheikhan, Bejani,& Gharavian, 2012). According to Schuller,& Rigoll (2009) language modeling in connection with emotions during utterance is affected by the type of individual. Holodynsky,& Friedlmeier (2006) state, that the process of emotion production during utterance is affected by interindividual differences. In our study we aim at an investigation of interindividual differences and language type of information processing in the category width 'broad categorizers' i.e. at global processing of language information. We investigate an expressive form (production of emotional factors) in an utterance of a 'broad categorizer'. We pick up on studies (Munková et al., 2012, 2013, 2015, Stranovská et al., 2012, 2013), where the broad categorizer seems creative by the selection of language means. He/she chooses the sentence construction in which he/she can support his/her interpersonal attraction whereby he/she does not take into account language correctness to a great extent.

The aim of our study is how a 'broad categorizer' models his/her emotional factors in speech production of a request in situations of social proximity, distance, with/without social power.

2. Broad categorizer and language models of emotional factors

A broad categorizer represents the cognitive style 'category width'. Cognitive style as a variable measures the power of the preferred way in which the information is proceeding (Scholl, 2001). It relates to mental patterns which an individual uses when problem solving. Cognitive style is usually described as a fixed and permanent individual dimension, which affects the attitudes, values and social interaction. 'Category width' cognitive style (C-W, author Pettigrew, 1958) is used as a mediator of individual differences and it marks consistency in a range of cognitive categories. It consists of two extreme poles. Broad categorizer achieves better results in the tasks with integrated holistic strategy. By contrast, a narrow categorizer is very good at the tasks which require detailed and analytical information processing. In our study we focus on 'the broad categorizer'. Several studies showed (Pettigrew, 1958, Sarmány-Schuller, 1992, 1997, 2007, Jurčová,& Sarmány-Schuller, 1993) that the broad categorizers are more independent, riskier and original in social situations; they have a need to be freer and have more variety of experiences. The broad categorizers have a higher need to solve a problem and not to give up, but at the same time they show also higher procrastination, in which an anxiety or cognitive filtration is a regulation.

Interaction between cognition and emotion plays an essential role in an individual´s speech production. According to Nahl (2007) this cooperation is also displayed as a possibility to measure an affective load by information searching. Emotional factor modeling in language models is a difficult process, in which various variables and language/ emotions models cooperate. Ellsworth,& Scherer (2003) state that it is a matter of individual assessment of proximity, valence and relative value of each situation. Gross,& Thompson (2007) set up a modal model of emotions which represents common points for researchers and theorists. Namely, it is 5 groups of regulation processes: (1) situation selection, (2) modification of situation, (3) attention arrangement, (4) cognitive change and (5) answers setting.

Scherer (2005) describes a model of basal emotions, i.e. an approach flowing from language origin. Words and statements describe the states, i.e. simple emotions. In accordance with them, observed physiological and expressive manifestations can be identified.

In our study, we flow from the model of speech acts of a request in a polite communication set up by Díaz-Pérez (2003), who took into account the selection of politeness factors in individual simulations works of Blum-Kulka, House,& Kasper (1989) and Trosborg (1994).

Díaz-Pérez (2003) set up various factors, but for our research purpose we choose the following emotional factors:

1. *Politeness factors* (**F20**): *thank you, please* – immediately before or after the request core,
2. *Pre-sequences* (**F21**): *Hello Mary, I wasn't at school yesterday, I felt sick so I stayed home*. Can you lend me...; *Hello, professor XY. I have a request for you. I forgot my phone at home and I need to make an urgent call*. Can I use your phone?,
3. *Post-sequences/supporting details* (**F22**): Could I use your phone? *It is very important to me and I have no other phone at hand.*,
4. *Mitigating devices* (**F23**): *Sorry for interrupting, I remembered that…*,

5. *Minimizers* (**F24**): …I would like to ask you for *a small favour*…; Could I have it *for a minute* to copy it? I need it for my work. *Only a couple of chapters. I'll return it immediately...*,
6. *Consultative mechanism* (**F25**): Do you think I can have a shot of your notes? Please, would you mind if I use your telephone? I have to make a very urgent call…,
7. *Compliments/sweeteners*, elements intensifying the likelihood of a request fulfilment (**F26**): Could you help me prepare for my essay as I know you are very knowledgable in the subject.,
8. *Intensificators* (**F27**): *important, as soon as possible, quick*,
9. *Promises, reciprocity* (**F28**): Excuse me. Would it be o.k. if I borrowed the book for half an hour to photocopy a couple of chapters? *I'll bring it straight back.*,
10. *Combination of previous* (**F29**): I feel rude asking you this, but I need to make an urgent phonecall. There are no phones nearby. Would you mind if I used your phone? (*Mitigating devices + Pre-sequences*).
11. *Others* (**F30**)

3. Method

3.1. Participants

Research was carried out at the Faculty of Arts and Faculty of Education, Constantine the Philosopher University in Nitra (CPU in Nitra) and at the Faculty of Applied Languages, University of Economics in Bratislava. It was attended by 148 students from different major bachelor study programs. The age of students (participants) was from 19 to 22 years.

3.2. Measure and procedure

Estimation Scale C-W (*Category Width*) – the C-W Scale measures Cognitive Style ´Category Width´ and the real estimation. The author is Pettigrew (1958), Slovak translation by Jurčová,& Sarmány-Schuller (1993) who pointed to the origin and development of the methodology for measuring cognitive style category width, to the process of its adaptation in the Slovak environment and to the first results obtained from a sample of university students, adults with university education with an emphasis on social situations.

It contains 20 statements that suggest certain statements in the form of an average value; the respondent has to guess which of the four fixed numerical alternatives corresponds with the highest and lowest number of occurrences of a given phenomenon.

The responses were assessed on three scores: C-W1 (in our case a) expresses the average value obtained from the estimates of highest values, C–W2 (in our case b) from the estimates of lowest values and C-W3 is the total questionnaire score (sum of C-W1+C-W2). As follows from the definition of broad categorization, estimates are far away from the average in both high as well as low values. At the same time, C-W1 and C-W2 values should be in all cases very close or identical.

The Speech acts simulation questionnaire – the questionnaire (author Díaz-Pérez, 2003) examines the influence of emotion in speech production. It investigates the occurrence of internal and external factors (social, language and emotional/expressive factors) in the speech acts of requests, in apologies, thanks and complaints, which are the basic politeness speech acts.

For our purpose we chose emotional/expressive factors and requests classified into three individual categories: S1 - situation of social proximity without social power, S2 - situation of social proximity with social power and S3 - situation of social distance with social power.

S1 *You did not attend the last lecture and you are asking your peer to lend you his notes.*

S2 *You are in the professor's office and you need to make an urgent call. You are in a situation where no other phone can be used so you ask the professor to use the one in his office.*

S3 *You are preparing a presentation for a key subject and you've just learned there is a new professor at the department specializing in your topic. You don't know the new professor but you decide to pay him a visit and ask him to read the summary of your work and recommend you some literature.*

3.3. Analysis and results

The association rule analysis represents a non-sequential approach to the data being analyzed. We will not analyze the sequences but rather the transactions, so we will not include the order of factors used in the analysis. In our case, a transaction represents the set of factors observed in the texts of requests in the situations .The web graph (Fig.1) depicts the discovered association rules for the requests, specifically the size of node representing the support of incidence of the factor, the thickness of the line represents the support of the rule – pairs of factors (probability of occurrence in the pair) and the darkness of the line color presents a lift of the rule – the probability of a pair occurrence in a transaction separately. The lift, which defines how many times the factors of request occur more often together as if they were statistically independent. In cases when the lift is more than 1, selected pairs occur more often jointly than separately in the set of used factors of the request. It is necessary to take into account that in characterizing the degree of interestingness – the lift, the orientation of the rule does not matter.

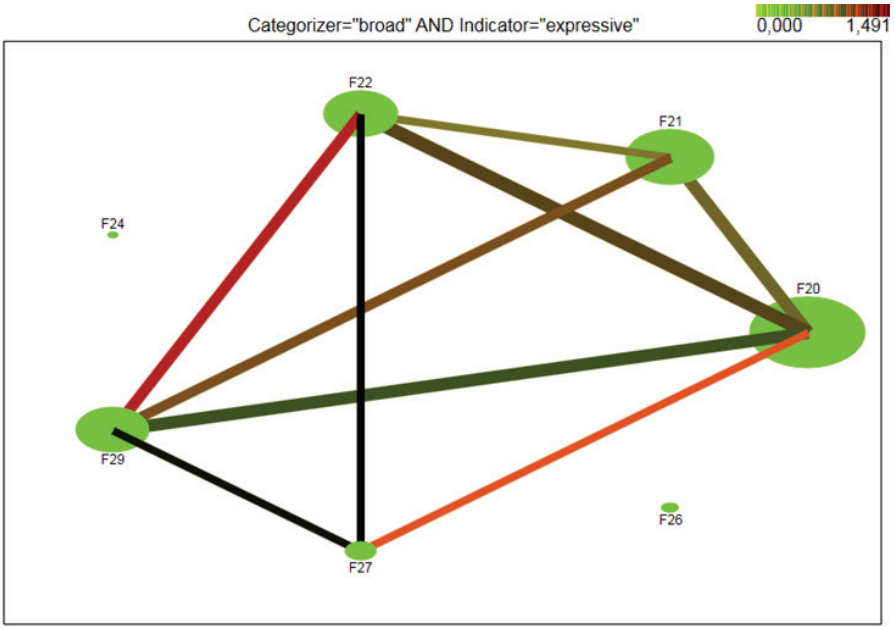

Fig. 1. Web graph – a visualization of the discovered rules – a broad categorizer.

We can see from the graph (Fig. 1) that in the category width ‘broad categorizer’, the factors of request F20, F21, F22 and F29 (support > 47%) belong to the most frequently used factors; similarly the combination of these factors` pairs (F20, F22), (F20, F29), (F20, F21) and (F22, F29) (support > 31%). The factors F27==>F22, F27==>F29, F29==>22 and F20==>F22 occur in sets of factors of request more often together than as separate units (lift>1). In these cases the highest degree of interestingness was achieved.

4. Discussion and conclusion

We assumed dynamics in production of language models of the ‘broad categorizer’ in the category of emotional/expressive factors under the influence of simulated social situations. Simulation of the social situations represented a known environment for the participants, i.e. it was a university environment (study environment). We tried to simulate communication among the students (asking for the lecturer´s notes) and communication with professors (asking for an urgent call or asking to read the summary of your work and recommend you some

literature). We investigated the occurrence of expressive factors and their combination of the 'broad categorizer', i.e. an individual with global information processing.

We found that the' broad categorizer' models a request in the mother tongue using expressive factors at a high rate. He/she uses not only simple forms of expressive factors but also their more complex forms. The 'broad categorizer' most frequently uses expressive factors like politeness factors (e.g. please, thank you), pre-sequences, post-sequences/supporting details or a combination of previous ones. Usually, he/she combined simple politeness factor with expressive factors which express complex politeness like politeness factors with post-sequences/supporting details (e.g. *Could I use your phone, please? It is very important to me and I have no other phone at hand.*) or with pre-sequences (e.g. *Hello, professor XY. I have a request on you. I forgot my phone at home and I need to make an urgent call. Can I use your phone, please?*).

It is noteworthy, that he/she does not consider an intesificator to be an enough powerful emotional factor to persuade the requestee to fulfil a request, but he/she uses it as a support to intensify the meaning of post-sequences, i.e. to intensify a reason of the request.

The 'broad categorizer' needed to intensify the causes (feelings and emotions) of requests before and also after the request expression. This finding – a connection between these expressive factors is substantial, because it was not shown in previous research focusing on social and expressive factors (Díaz-Peréz, 2003, Munková et al., 2012, 2013, 2015, Stranovská et al., 2013). It can be caused, that the 'broad categorizer' is characterized by taking a risk in social situations (Jurčová,& Sarmány-Schuller, 1993), with a lower degree of anxiety, originality, a need for freedom (Pettigrew, 1958, Sarmány-Schuller, 1992), verbal creativity or with a need for interpersonal attraction in language processing (Stranovská et al., 2012).

The 'broad categorizer' produced minimisers and compliments in the request separately. He/she considered them to be enough powerful to persuade a requestee to fulfil his/her request.

An expressive factors modelling in language models is a complex process, where various variables, language models or emotions concur. We perceive an investigation of these models in the context of individuality as a significant impulse in language examination, because it allows an observation of the interaction between cognition and emotion in an individual´s language processing, considering his/her individuality.

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